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December 03, 2004

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APPLICATION NUMBER: ***60/513,474***
FILING DATE: ***October 22, 2003***
RELATED PCT APPLICATION NUMBER: ***PCT/US04/35200***

Certified by

Jon W Dudas

Acting Under Secretary of Commerce
for Intellectual Property
and Acting Director of the U.S.
Patent and Trademark Office

PTO/SB/16 (10-01)
Approved for use through10/31/2002. OMB 0651-0032
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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

Express Mail Label No. EV310451745US

60/513474 102203

INVENTOR(S)

Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
Paul L.	Scherzer	Midland, Texas

☐ Additional inventors are being named on the _______ separately numbered sheets attached hereto

TITLE OF THE INVENTION (500 characters max)

A METHOD AND SYSTEM FOR GENERATING ELECTRICITY UTILIZING NATURALLY OCCURRING GAS

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ENCLOSED APPLICATION PARTS *(check all that apply)*

☑ Specification *Number of Pages* 12
☐ CD(s), Number
☑ Drawing(s) *Number of Sheets* 2
☑ Other (specify) Credit Card Payment ~~Form; Express Mail Cert~~
☐ Application Data Sheet. See 37 CFR 1.76

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT

☑ Applicant claims small entity status. See 37 CFR 1.27.
☐ A check or money order is enclosed to cover the filing fees
☑ The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number: 50-0902
☐ Payment by credit card. Form PTO-2038 is attached.

FILING FEE AMOUNT ($) $80.00

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☑ No.
☐ Yes, the name of the U.S. Government agency and the Government contract number are: ____________

Respectfully submitted,

SIGNATURE ____________

Date 10/22/2003

TYPED or PRINTED NAME John X. Garred

REGISTRATION NO. *(if appropriate)* 31830

TELEPHONE 216-696-3340

Docket Number: 10058/00002

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

14461 U.S. PTO

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FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

☑ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($)

Complete if Known	
Application Number	
Filing Date	Herewith
First Named Inventor	Paul L. SCHERZER
Examiner Name	
Art Unit	
Attorney Docket No.	10058/00002

METHOD OF PAYMENT *(check all that apply)*

☐ Check ☑ Credit card ☐ Money Order ☐ Other ☐ None

☑ Deposit Account:

Deposit Account Number: 50-0902 (10058/00002)

Deposit Account Name: Tucker Ellis & West LLP

The Director is authorized to: *(check all that apply)*

☑ Charge fee(s) indicated below ☑ Credit any overpayments

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FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1001	770	2001	385	Utility filing fee	
1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	770	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	80.00

SUBTOTAL (1) ($) 80.00

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

			Extra Claims		Fee from below		Fee Paid
Total Claims		-20** =		X		=	
Independent Claims		- 3** =		X		=	
Multiple Dependent						=	

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
1202	18	2202	9	Claims in excess of 20
1201	86	2201	43	Independent claims in excess of 3
1203	290	2203	145	Multiple dependent claim, if not paid
1204	86	2204	43	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($)

***or number previously paid, if greater; For Reissues, see above*

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for *ex parte* reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	420	2252	210	Extension for reply within second month	
1253	950	2253	475	Extension for reply within third month	
1254	1,480	2254	740	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
1401	330	2401	165	Notice of Appeal	
1402	330	2402	165	Filing a brief in support of an appeal	
1403	290	2403	145	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,330	2453	665	Petition to revive - unintentional	
1501	1,330	2501	665	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
1503	640	2503	320	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	770	2809	385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	770	2810	385	For each additional invention to be examined (37 CFR 1.129(b))	
1801	770	2801	385	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify) ____________

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($)

SUBMITTED BY (Complete *(if applicable)*)

Name (Print/Type)	John X. Garred	Registration No. (Attorney/Agent)	31,830	Telephone	216-696-3340
Signature				Date	October 22, 2003

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

This collection of information is required by 37 CFR 1.17 and 1.27. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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MAIL CERTIFICATION UNDER 37 CFR 1.10

I hereby certify that the attached U.S. Provisional Patent Application (along with any other paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on this date **October 22, 2003** in an envelope as "Express Mail Post Office to Addressee" Mailing Label Number **EV310451745US** addressed to the: Mail Stop Provisional Patent Application, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.

Valerie A. Salvino
(Typed or Printed Name of Person Mailing Paper)

Valerie A. Salvino
(Signature of Person Mailing Paper)

CLE 755236.1
10058/00002

U.S. Provisional Patent Application for

A METHOD AND SYSTEM FOR GENERATING ELECTRICITY UTILIZING NATURALLY OCCURRING GAS

Background of the Invention

The present invention pertains generally to the generation of electricity using naturally occurring gas and, more particularly, to a method and system of generating electricity by gas turbines using carbon dioxide, nitrogen, or other natural gases.

Electricity represents a vital and necessary component of the economy, as well as every day life. A constant flow of electricity sufficient to meet the ever-increasing demands of the consuming public is a necessity. As the population has increased, the use of electricity driven machines has also increased, thereby increasing the demand across the grid. Greater demand has caused severe problems, including blackouts, power outages, brownouts and the like.

The most common source of electricity is a steam driven turbine, which supplies rotational power to a generator. The operation of a generator is well known in the art, and as such does not require further explanation herein. Burning a fuel in a furnace converts water into steam, which is then used to turn the turbine blades at a power generation plant. The fuel is derived primarily from flammable natural gas, petroleum, e.g., oil, or coal. However, all of the aforementioned fuels, when burned, produce some varying level of pollutants resulting from the combustion of the fuel in the furnace. In the case of coal driven power plants, scrubbers must be inserted into smokestacks to effectively remove the most harmful of pollutants. An additional concern revolves around the ever-increasing prices of oil and natural gas by producing countries.

A previous attempt to combat these costs and pollution problems was made by using controlled nuclear reactions. Fission nuclear power plants generate electricity by using a steam

turbine. One of the by-products of nuclear fission is high temperatures. Another by-product, however, is radiation. In operation, radioactive water is pumped through the reaction chamber, in essence flashing to steam. This superheated steam is transported through insulated pipes to draw near clean water. This clean water is flashed to steam and subsequently directed to large turbine blades, which are coupled to generators, thereby producing electricity. However, the existing nuclear power plants were very expensive to build and opposition from environmentalists was and continues to be problematic.

Several types of renewable energy sources are currently implemented for power generation. Hydroelectric power plants use water, either naturally flowing or forced through a dam, to turn large generators. The application of these plants, which account for 9% of the United States energy production, is limited to those areas with naturally occurring bodies of water. Geothermal power plants use steam created by water and magna to generate electricity. However, locating and securing a constant source of steam thus generated is difficult and not widely available. Solar power, on the other hand, is becoming more prevalent as an alternative means of generating electricity. Photovoltaic cells create electricity directly from sunlight. However, even the most advanced photovoltaic cells do not exceed 15-20% efficiency, and as generating means, the cells are only good for half of the day.

Another source of renewable energy is wind power. Massive propellers, powered by the wind, rotate in large wind farms, turning generators to create electricity. The use of windmills to generate electricity is becoming more prevalent, however similar to solar power, weather conditions can effect output and blackouts may occur with very slow winds. Still another source of renewable energy that has not seen great production of electricity is the use of biomass to fire boilers, thereby generating steam. Biomass relates to wood, agriculture, biological wastes and

garbage that may be burned in large furnaces to generate the heat necessary to create steam for the turbine generators.

The accepted definition of a natural gas is a gas formed and trapped underground by nature. Understandably, when the words "natural gas" are mentioned, one thinks of the natural gas that cooks meals or supplies heat to keep one warm, i.e., methane, propane or the like. These represent naturally occurring flammable gases in the minds of the general public. However, large underground reservoirs of other natural gases exist, such gases being nonflammable. Carbon dioxide reservoirs and nitrogen reservoirs have been discovered with large reserves and under high pressures. Currently, the primary use of carbon dioxide of these reservoirs is as a flooding agent, injected into oil reservoirs for the secondary recovery of petroleum. This represents a minute quantity of the total carbon dioxide present in these naturally occurring reservoirs. Thus, while these gases are nonflammable, little to no demand exists for these naturally occurring gases.

Thus, there exists a need for a method and system for generating electricity by turbine using nonflammable naturally occurring gas.

Summary of the Present Invention

The present invention provides for a system and method for the generation of electricity by using inexpensive and naturally occurring nonflammable gases

In accordance with the present invention, there is provided a system and method for generating electricity without the generation of pollutants.

Further in accordance with the present invention, there is provided a system and method for the use of naturally occurring and renewable gases as a source of energy to power turbine generators to produce electricity. A production well and an injection well are located above a

naturally occurring reservoir of high-pressure gas. The producing well, equipped with a cutoff valve, allows for high-pressure gas to be carried from the well to a turbine or turbines. The turbine or turbines are connected to generators for the production of electricity. A small portion of the generated electricity is used to operate a compressor, enabling the recovery of used gas. The used gas is then transported, via a pipeline, from the compressor to the injection well, enabling the reintroduction of used gas into the reservoir.

In one embodiment, the present invention produces the carbon dioxide or nitrogen to utilize the powerful flow of the gas to turn the blades of a turbine or a series of turbines. To produce the carbon dioxide or nitrogen, a well will be drilled into the reservoir. The produced gas will be flowed through a pipeline into the nearby turbine or series of turbines, which are encased in a sealed container to prevent leakage into the atmosphere. The flow of gas will turn the turbine blades, which then turn the shaft. The turbine shaft is connected to the generator and turns the rotors to create electricity.

The turbine has an outlet to release the used gas into a pipeline to flow to a nearby compressor. The compressor is connected by a pipeline to a nearby well that has been drilled into the gas-producing reservoir. The compressor injects the gas back into the reservoir for pressure maintenance. Those skilled in the art will appreciate that other methods and materials may be used to maintain the pressure of the reservoir, e.g., water or the like. Such methods and materials, currently utilized in the production of petroleum and flammable natural gasses are examples one skilled in the art would find readily apparent.

In another embodiment, a check valve may be installed in the pipeline between the producing well and the turbines to control the flow of gas. A cutoff valve may also be installed at the producing wellhead for safety and prevention of pressure loss.

In yet another embodiment, the compressor of the present invention may be powered by electricity generated onsite. As a result of the ease of operation envisioned by the present invention, a smaller area will be utilized as compared to a comparable flammable natural gas production facility.

Additional objects, advantages and novel features of the invention will be set forth in part in the description which follows, and in part will become apparent to those skilled in the art upon examination of the following or may be learned by practice of the invention. The objects and advantages of the invention may be realized and attained by various structures and methods as covered by the patent claims.

Brief Description of the Drawings

The accompanying figures incorporated in and forming a part of the specification, illustrates several aspects of the present invention, and together with the description serve to explain the principles of the invention. In the figures:

FIG 1 is a diagram illustrative of the system of the present invention utilizing a single turbine; and

FIG 2 is a diagram illustrative of the system of the present invention utilizing a series of turbines.

Detailed Description of Preferred and Alternate Embodiments

The present invention is directed to a system and method for using a renewable energy source to power a turbine to operate a generator to produce electricity. The operation of a generator is well known in the art and one of ordinary skill will appreciate that the type of generator used will be of a type typically used for power generation. Furthermore, the operations of a turbine, particularly those turbines driven by steam are also well known in the art. The

present invention uses both generators and turbines, in accordance with the standard operations thereof. As will become apparent to those skilled in the art from the accompanying drawings, the present invention may be applied to a single turbine to generator combination, or may act to a series of turbines operating to produce electricity.

Turning first to FIG. 1, there is shown a system diagram of the present invention as implemented in a single turbine to generator configuration. One of skill in the art will appreciate that the following description utilizes the naturally occurring pockets of carbon dioxide or nitrogen to turn the turbine, any naturally occurring gas under pressure may be used. A large reservoir of naturally occurring gas (not shown) is located below the producing well 102. A wellhead (not shown) is fitted with a cutoff valve 104 to prevent the loss of pressure of the reservoir, as well as implemented for safety considerations. Coupled to the wellhead, there is a pipe 106 to transport the gas from the producing well 102 to the turbine 108. The pipe 106 is suitably adapted to contain the high pressures associated with the reservoir and may be composed of any material capable of handling the high pressures and low temperatures inherent with such high pressure gases, such as steel. It will be appreciated by those skilled in the art that the diameter of the pipe 106 is to be suitably adapted to allow for pressure enough to spin the turbine 108, while prevent rupture of the pipe 106 itself.

As shown at the turbine 108, there is a shaft 110 that is suitably coupled to a generator 112. The shaft 110 turns the rotor 113 of the generator 112 to generate electricity. The electricity generated by the generator 112 is transmitted via line 118a to a step up transformer 114. The operations of a transformer are well known in the art. The transformer 114 steps up the voltage received from the generator 112 via line 118a to a voltage capable of transmission on the high voltage lines 116. It will be appreciated by those skilled in the art that the methods for

transmission of electricity are well known. The electricity thus generated is transmitted over the high voltage transmission lines 116 to substations (not shown) and finally to the user.

As contemplated by the present invention, in order to facilitate the recovery of the gas used to drive the turbine 108, the system thus described allows for the transmission of the used gas through a pipe 124 to a compressor 126. It will be understood by those of ordinary skill in the art that the pipe 124 will be composed of a suitably adapted material capable of carrying gas without leaking such gas into the outside environment. Furthermore, the person of ordinary skill in the art will appreciate that the composition of the pipe 124 will be of similar size and manufacture to that of pipe 106. The compressor 126 allows for the recompression of the gas recovered from the reservoir to a pressure capable of being reintroduced into the reservoir. The inclusion of the compressor 126 enables the system to maintain the high pressure of the reservoir for future operation of the turbine 108.

The compressor 126 is suitably adapted to compress returning gas using an electric motor (not shown). Power to operate the compressor 126 is drawing directly from the generator 112 prior to the stepping up of voltage by the step up transformer 114. This electricity is transmitted from the generator 112 to the compressor 126 by means of transmission line 118b. It will be appreciated by those skilled in the art that the composition of the transmission lines 118a and 118b will be suitably adapted to carry the electricity. To facilitate ease of operation, the transmission line 118b is operatively connected to a transformer 120. The transformer 120 is suitably adapted to either step up or step down the voltage generated by generator 112, as required by the electrical motor running the compressor 126. The voltage output from the transformer 120 is then transmitted via transmission line 122 to the electrical motor of the compressor 126.

As gas is compressed in the compressor 126, it is shunted via pipe 128 to the injection well 130. The pipe 128 is suitably adapted to carry such high-pressure gas without loss to the outside environment. It will be appreciated that the compressor 126 is suitably adapted to generate the pressures required to maintain the internal pressure of the reservoir and thus keep the system operational. In one particular embodiment, a check valve (not shown) is incorporated into the wellhead (not shown) located at the injection well 130. As used herein, a check valve is intended to describe any valve known in the art that allows for the one-way transmission of a fluid or gas, thereby preventing a back-flow through the system. To put in other words, the check valve allows the reintroduced gas back into the reservoir, but does not allow gas to exit the reservoir.

Turning now to FIG 2, there is shown a system embodying the concept of the present invention utilizing a plurality of turbines and generators. It will be appreciated that the number of turbines and respective generators shown is for exemplification and should not be construed to limit application of the present invention solely to the number shown in FIG 2. The producing well 202 is located above a reservoir containing a naturally occurring gas under high pressure. To prevent the loss of such high pressure, a cutoff valve 204 is incorporated into the wellhead (not shown) of the producing well 202. As high-pressure gas is released by the producing well 202 through the wellhead and incorporated cutoff valve 204, it is carried by a pipe 206 to a junction for further delineation. The pipe 206 is suitably adapted to carry gas under high pressures and envisioned to maintain such high pressures without loss of the gas to the outside environment.

The junction of the pipe 206 is suitably located relative to turbines 212a, 212b, 212c and 212d, so as to enable the use of equal length pipes 210a, 210b, 210c and 210d. It will be understood by those skilled in the art that the use of equal length pipes 210a, 210b, 210c and

210d is not required, but eases the transmission of high pressure from the main pipe 206 to the turbines 212a, 212b, 212c and 212d, respectively. It will further be appreciated by those skilled in the art that the composition of the pipes 210a, 210b, 210c and 210d may be of any suitable type typically used for the transmission of high-pressure gas. Shown in FIG 2, there are cutoff valves 208a, 208b, 208c, and 208d located on the pipes 210a, 210b, 210c and 210d. The use of such cutoff valves 208a, 208b, 208c and 208d serves multiple purposes.

In the event of failure of one or more turbines 212a, 212b, 212c and 212d, one or more respective cutoff valves 208a, 208b, 208c and 208d may be activated, thereby preventing the loss of gas to the outside environment, or damage to the remaining operating turbines. Similarly, the activation of one or more cutoff valves 208a, 208b, 208c, or 208d will enable maintenance of the respective turbine, while enabling the system to continue the production of electricity with the remaining functional turbines.

Each of the turbines 212a, 212b, 212c and 212d is operatively connected to a respective shaft 214a, 214b, 214c, and 214d for transmission of power to generators 216a, 216b, 216c and 216d, respectively. The shafts 214a, 214b, 214c, and 214d are suitably connected to the rotors 215a, 215b, 215c and 215d of the generators 216a, 216b, 216c and 216d. The generators 216a, 216b, 216c and 216d operate to produce electricity, which is subsequently transmitted to a step up transformer 220 for transmission via transmission lines 222 to the end consumer. The transmission lines 218a, 218b, 218c, and 218d are suitably adapted to carry the electricity produced by the generators 216a, 216b, 216c and 216d to the step up transformer 220. It will be understood by those skilled in the art that the transmission lines 218a, 218b, 218c and 218d are constructed of materials typical of electrical transmission lines.

In the preferred embodiment using multiple generators 216a, 216b, 216c and 216d, an electrical transmission line 224 is coupled to one of the generators 216a, 216b, 216c and 216d, as shown in FIG 2 as the first generator 216a. The transmission line 224 coupled to generator 216a is connected to a transformer 226. The transformer 226 is suitably adapted to either step up or step down the voltage received over the transmission line 224 for supplying power to a compressor 232. The compressor 232 is suitably adapted to receiving used gas from the turbines 212a, 212b, 212c and 212d and compressing the gas for reintroduction into the reservoir. The compressor 232 is operated by an electrical motor (not shown) receiving power from the transformer 226 via a transmission line 228. The transmission line 228 is suitably adapted to carry the requisite voltage enabling operation of the compressor 232. Once skilled in the art will appreciate that in the event of downtime on the first generator 216a, an alternate transmission line 238 may be suitably coupled to a second generator 216b to provide power to the compressor 232. Such downtime may be the result of maintenance or the like on the first generator 216a, however the transmission line 238 may be utilized in other circumstances where the first generator 216a is unable to generate electricity.

During operation of the system depicted in FIG 2, used gas is expelled from the turbines 212a, 212b, 212c and 212d into a pipe 230. The pipe 230 may be any suitable pipe for carrying gas without loss into the outside environment that is known in the art. The pipe 230 is connected to the compressor 232, enabling the recompression of used gas prior to reintroduction into the reservoir. As gas is compressed by the compressor 232, it is shunted through a pipe 234 to an injection well 236. The pipe 234 may be any pipe suitable for carrying high-pressure gas without loss to the outside environment that is known in the art. Upon reaching the injection well 236, the gas is forced back into the reservoir through a wellhead (not shown), thereby maintaining the

high pressure of the naturally occurring gas reservoir. It will be appreciated by those skilled in the art that further safety and efficiency of the multiple turbine configuration of the present invention may be achieved by the incorporation of a check valve into the wellhead of the injection well 236.

In either of the foregoing embodiments, it will be understood by those skilled in the art that the operation of the system and method of operation envisioned by the present invention may be implemented using electronic controls. Such electronic controls may, for example, include the incorporation of computer monitoring facilities and databases. The computer facilities enable the power production facility to track, monitor and maintain the integrity of the system. In the event of leak in one of the pipes, the computer facilities will enable the quick assessment of the location of the leak and the activation of the numerous safety and efficiency devices, as described above.

The foregoing description of a preferred embodiment of the invention has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise form disclosed. Obvious modifications or variations are possible in light of the above teachings. The embodiment was chosen and described to provide the best illustration of the principles of the invention and its practical application to thereby enable one of the ordinary skilled in the art to utilize the invention in various embodiments and with various modifications as are suited to the particular use contemplated. All such modifications and variations are within the scope of the invention as determined by the appended claims when interpreted in accordance to the breadth to which they are fairly, legally and equitably entitled.

ABSTRACT

The present invention is directed to a system and method for the use of naturally occurring and renewable gases as a source of energy to power turbine generators to produce electricity. A production well and an injection well are located above a naturally occurring reservoir of high-pressure gas, such as nitrogen or carbon dioxide. The producing well, equipped with a cutoff valve, allows for high-pressure gas to be carried from the well to a turbine or turbines. The turbine or turbines are connected to generators for the production of electricity. A small portion of the generated electricity is used to operate a compressor, enabling the recovery of used gas. The used gas is then transported, via a pipeline, from the compressor to the injection well, enabling the reintroduction of used gas into the reservoir.

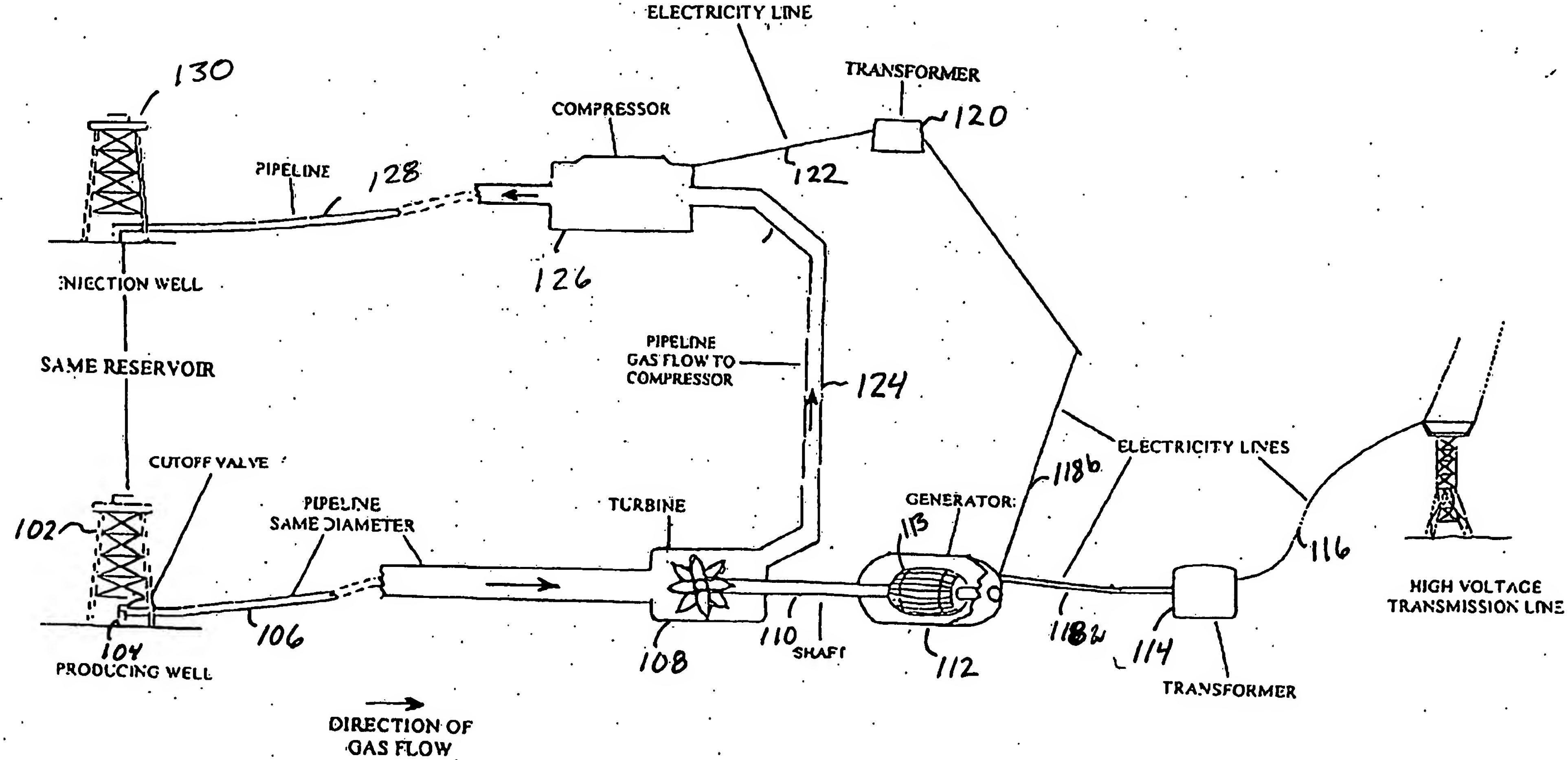
ELECTRICITY LINE
TRANSFORMER
120
130
COMPRESSOR
PIPELINE
128
122
126
INJECTION WELL
SAME RESERVOIR
PIPELINE
GAS FLOW TO
COMPRESSOR
124
CUTOFF VALVE
102
PIPELINE
SAME DIAMETER
TURBINE
GENERATOR
113
118b
ELECTRICITY LINES
116
106
104
PRODUCING WELL
108
110
SHAFT
112
118a
114
TRANSFORMER
HIGH VOLTAGE
TRANSMISSION LINE
DIRECTION OF
GAS FLOW

FIG. 1

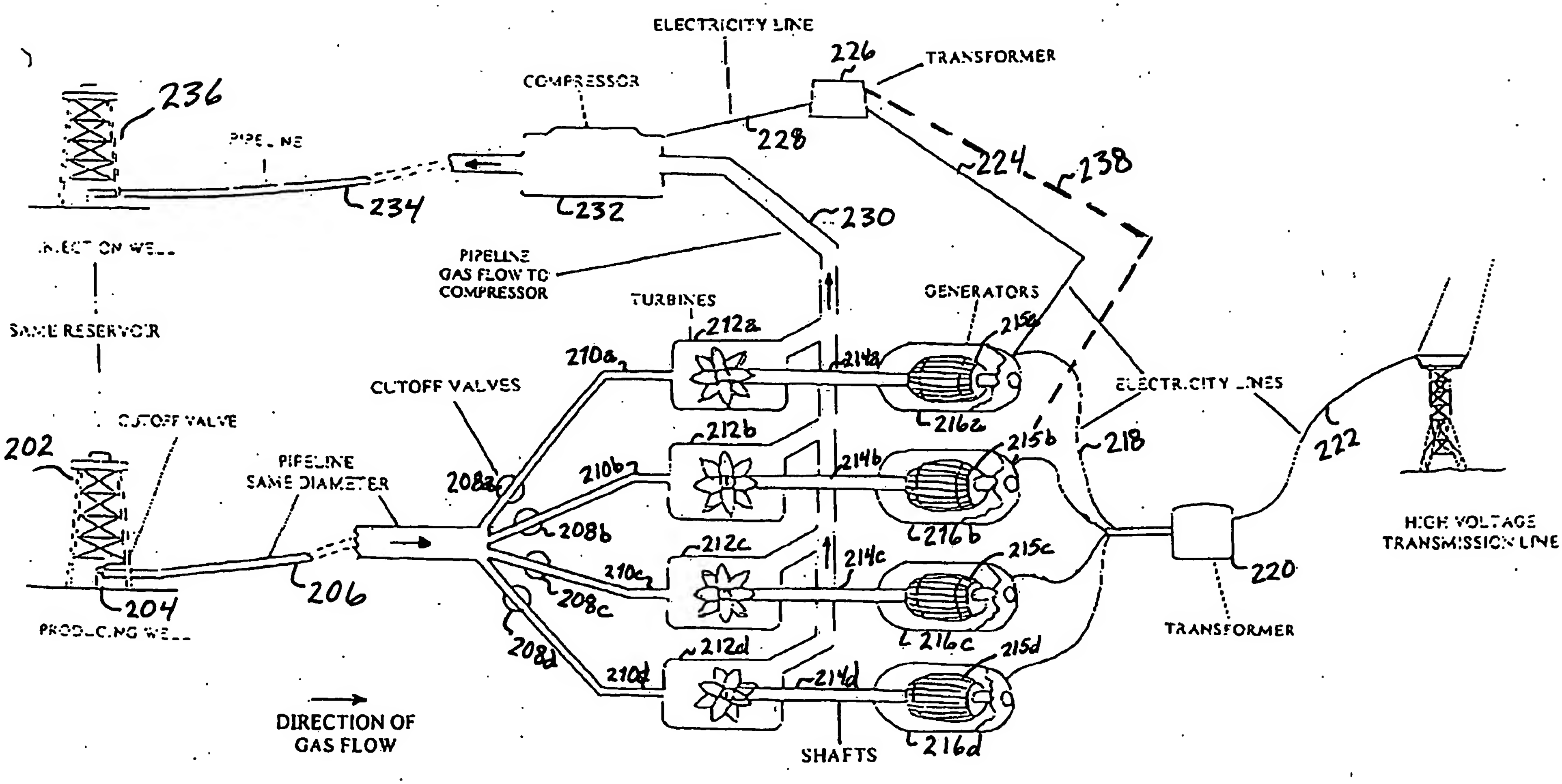
ELECTRICITY LINE
226
TRANSFORMER
COMPRESSOR
236
PIPELINE
228
224
238
234
232
230
INJECTION WELL
PIPELINE GAS FLOW TO COMPRESSOR
TURBINES
GENERATORS
SAME RESERVOIR
212a
215a
210a
214a
CUTOFF VALVES
ELECTRICITY LINES
CUTOFF VALVE
216a
218
202
212b
215b
222
PIPELINE SAME DIAMETER
210b
214b
208a
208b
216b
HIGH VOLTAGE TRANSMISSION LINE
212c
215c
214c
210c
206
204
208c
220
PRODUCING WELL
216c
TRANSFORMER
212d
215d
208d
210d
214d
DIRECTION OF GAS FLOW
SHAFTS
216d

FIG. 2

Document made available under the Patent Cooperation Treaty (PCT)

International application number: PCT/US04/035200

International filing date: 22 October 2004 (22.10.2004)

Document type: Certified copy of priority document

Document details: Country/Office: US
Number: 60/513,474
Filing date: 22 October 2003 (22.10.2003)

Date of receipt at the International Bureau: 13 December 2004 (13.12.2004)

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b)